Pancreatic Tissue Transplanted in TheraCyte Encapsulation Devices Is Protected and Prevents Hyperglycemia in a Mouse Model of Immune-Mediated Diabetes.

Journal: Cell Transplant

Publication Year: 2016

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PubMed link: 26300527

Funding Grants: Preclinical and clinical testing of a stem cell-based combination product for insulin-dependent diabetes, Clinical Development of a Cell Therapy for Diabetes

Public Summary:
Type 1 diabetes (T1D) is characterized by destruction of glucose-responsive insulin-producing pancreatic beta-cells and exhibits immune infiltration of pancreatic islets, where CD8 lymphocytes are most prominent. Curative transplantation of pancreatic islets is seriously hampered by the persistence of autoreactive immune cells that require high doses of immunosuppressive drugs. An elegant approach to confer graft protection while obviating the need for immunosuppression is the use of encapsulation devices that allow for the transfer of oxygen and nutrients, yet prevent immune cells from making direct contact with the islet grafts. Here we demonstrate that macroencapsulation devices (TheraCyte) loaded with neonatal pancreatic tissue and transplanted into RIP-LCMV.GP mice prevented disease onset in a model of virus-induced diabetes mellitus. Histological analyses revealed that insulin-producing cells survived within the device in animal models of diabetes. Our results demonstrate that these encapsulation devices can protect from an immune-mediated attack and can contain a sufficient amount of insulin-producing cells to prevent overt hyperglycemia.

Scientific Abstract:
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